OPTIMIZATION OF LIME KILN PROCESS

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ABSTRACT

Lime kiln plays an important role in the calcium cycle in the recovery area in a pulp mill. The lime kiln process consists in reburn lime mud that were generated previously at the causticizing plant. At the lime kiln the purpose is convert calcium carbonate ($CaCO_3$) to Calcium Oxide (CaO) by using energy. Typically, the source or energy are fossil fuels and electricity.

To improve the kiln efficiency, were implemented advanced controls, to optimize the usage of energy demand, maintaining quality proprieties of lime and increasing the lime production.

Three main controls were developed: Production Control, Residual O_2 Control and Residual Carbonate Control.

The production control delivers stable and constant lime mud supply, avoiding temperatures disturbances in the feeding area of the kiln. This is fundamental for the proper kiln operation.

In a pulp mill, kiln is one of the main energy consumers, so it is very important to use this energy in the most efficiently way possible.

To burn fuel, oxygen is needed, the advanced controls must optimize the usage of the oxygen during the burning process. By doing this it is minimized the energy losses to the environment and guaranteeing flue gas emission standards.

The final step is the calcination process, the advanced control for the residual carbonate guaranties stable and constant temperature for the lime calcination.

Combined all this three Controls guarantee a better lime quality with less deviation for the demand quality and optimize the total energy used to produce lime. During this work we notice an important reduction in the energy required to produce one ton of lime (GJ/ton).

Keywords: OPP, Andritz, Biotek, Lime kiln, APC, Process Optimization.